THE

BOSTON MEDICAL AND SURGICAL JOURNAL.

VOL. XL. WEDNESDAY, APRIL 11, 1849. No. 10.

FISKE FUND PRIZE DISSERTATIONS OF THE RHODE ISLAND MEDICAL SOCIETY.

NO. XI.—BY CHARLES WILLIAM PARSONS, M.D., PROVIDENCE.

[Communicated for the Boston Medical and Surgical Journal.]

" *Vis Medicatrix Naturæ—How far is it to be relied on in the Treatment of Diseases?*"

——" tenues grandia "——

Horat. Lyric., Lib. i., Carm. vi.

THE term *vis medicatrix naturæ* has been misused by some theorizers in medicine, till the truth it expresses has been thrown a little into disrepute. It has been made to stand for a sort of mythological personage, an angel of Hygeia, deputed to guard over the sick, and guide the events of disease by her intelligent watchfulness into favorable issues. In our own day, some speak of the powers of re-action as a set of independent functions, overruling the course of diseases; instead of being simply the result of functions that exist in health, now called out in a peculiar way, or excited in a higher degree, by some unusual, disturbing cause. Hence we hear it said that one person has stronger, another has weaker powers of re-action. In truth, however, the same person, or the same sort of constitution, that resists one kind of injury well, yields very easily to another. The power of re-acting under a shock to the nervous system, and that of repairing loss of substance from a mechanical injury, by no means go together. Children, for instance, easily sink under exposure to cold, or under the shock of a large burn; while they easily repair a loss of substance, as their nutritive processes are active.

In health, we continually see outward disturbing causes resisted by the living organs, and the machinery kept in harmonious play by powers belonging to itself. A blow is warded off by instinctive movements; heat calls forth on the skin a cooling, evaporating liquid; cold rouses the heat-producing powers; sneezing occurs, to throw off irritating particles from the nostrils. All the protective reflex actions to which Marshall Hall's researches have furnished the key, are instances of the same thing. These may very properly be all considered together, and ascribed to a preservative power, or, if there be any virtue in a Latin phrase, to the *vis conservatrix naturæ*. Now, no line can be drawn between these means that preserve the equilibrium of health, and those by which stronger disturbing influences are repelled, and which we may call remedial, instead of conservative. The causes of disease are disturbing powers, from within or without, that produce greater departures from this equilibrium of health. The resulting diseases show us together the direct effects of the offending cause, and those of the re-active efforts of the system. These last may be considered together, by themselves, and ascribed, for convenience's sake, to a restorative power—the *vis medicatrix naturæ.* Again, these restorative efforts being themselves out of the regular course of things, may themselves be disturbing causes, leading to new attempts at restoration.

The laws which rule the *vis medicatrix naturæ* are very hard to study and understand. The more intricate processes of disease cannot be watched by the eye, and only in certain situations by the ear. They are controlled by a thousand subtle influences, springing from all the mutually dependent parts of our frame, and from the infinitely varied agencies that surround us. They vary in each individual, both on account of "original differences of constitution, which are manifested in no way but by re-action in disease," and of "the particular state in which the economy may be in regard to the integrity of its organs, or the perfection of their functions at the moment when first impressed by the morbid agent. Hence medical experience is endless."* Again, moral considerations come in to hinder the free study of diseases as objects of natural history. There is in severe cases a very general belief that interference is needed; and we cannot sacrifice our patient's health or life, even with the view of gaining valuable knowledge. We cannot experiment with them as with re-agents in a laboratory.

Accordingly, the only natural remedial processes we are really well acquainted with are those which are called into play by causes easily understood, and easily excited at will, and which are directly observable by the senses. Such are the means of repairing mechanical injuries. They have been well described, both by surgical and physiological writers; and the visible facts are pretty well understood, though some points of theory are in dispute.

Our strength of belief here, as everywhere, bears proportion to the completeness of our knowledge. Everybody owns that in the healing of wounds, nature does the work; art only supplies and regulates the conditions. These processes can be seen; their exciting causes we can fully understand; and they can be studied in experiments on animals, which ingenuity can vary at will. In internal processes of disease and natural cure, our knowledge is more limited, and the conviction of a healing intention in them is proportionately weaker. Among the reasons for hoping an advancement in this knowledge, may be named, the improvement in our means of diagnosis, and of tracing the steps of nature in internal diseases, particularly by auscultation—the lessened disposition to think medicines necessary, which allows the physician to observe, without embarrassment, the high authorities enrolled in the list of observers of nature. The increased attention to diseases of animals, which we can observe without being troubled by moral considerations, may lead to a better understanding of the natural cure of diseases.

---

* I quote from a manuscript essay of my late endeared friend, Dr. Albert G. Upham, of Boston, who died of typhus fever, contracted during his attendance on Irish emigrants, June 16, 1847.

But we have to do with the present, and treat our patients according to the best knowledge of our day.

Now no one will say that in dealing with disease we should leave the sick man to chance, or to his whims and appetites, to determine the conditions under which his system shall work. The only question, in any given case, will be between the two ways of acting now to be named. First, we may come to the patient's side, understanding what can be understood of the laws of re-action, the curative efforts of nature, and with our minds and senses trained to observing them, and merely try to give these efforts a fair chance, to remove obstacles from their way, without introducing any new element of our own among the powers at work. Or, secondly, we may interfere to check these efforts of nature, or to check them in one direction and turn them into another, or excite or modify their operation, or introduce some new agent that shall call forth new movements in the system.

The first of these ways of acting is no doubt the one commonly spoken of as trusting nature. It includes the regulation of outward influences, position, bodily and mental exercise, &c., all that we call hygiene. But we may do much more than this, and still in strict truth be trusting the *vis medicatrix naturæ*. *We* cannot perhaps see the truth of what Hufeland says: "All healing of disease is effected by Nature; art is only her assistant, and cures through her. Even the direct cure of diseases by means of what are called specifics, is the work of Nature."* We do not understand enough of the *modus operandi* of cinchona in intermittents, for example, to fairly see how this is. But we often know that active medication is used only to remove obstacles to the natural curative powers. An ascites exists; we do not think it best to tap, but trust the absorbents to remove the liquid. We enforce an equable temperature, restrict drinks, &c., so that the intestinal veins may not be too full, may be thirsty for liquid. For just the same purpose, we give blue pill or a hydragogue, to unload the capillaries of the liver or intestinal coats. In both instances, we try, in accordance with known laws of physiology, to lessen the contents of the veins, so that nature's cure may go on. Still, believing such to be the meaning of the Trustees, I shall speak of all such active artificial measures as remedial—as not what is intended by trusting to nature.

How far, then, should the *vis medicatrix naturæ* be relied on in the treatment of diseases? The question cannot be answered systematically and in full. I shall only try to name some principles bearing on the main question, and touch on some of the more important disputed points.

I. The *vis medicatrix naturæ* should not be trusted by itself, when there arise exceedingly severe symptoms, or events in the processes of disease which are immediately dangerous to life, or to some important organ, and we have means of controlling those symptoms or events.

---

* Enchiridion Medicum. Berlin, 1836. Translated in British and Foreign Medical Review, April, 1847.

Cases of this sort may happen during almost any course of diseased actions, though the general tendency of these actions may be to restore health. There can be no question that we can control many such incidents in disease, though it may be harder to say whether we can directly shorten the diseased processes. Thus it may be doubted how far blood-letting can control the course of acute pneumonia; but it certainly may relieve urgent pain and dyspnœa. But, by relieving the patient from exhausting distress, or the system from immediately sinking under the weight of disease, or by saving some important part from being immediately disorganized, we may give nature a fair chance to work out a cure. We may thus determine recovery, from a disease, over whose essential chain of processes we have no direct power. This is, perhaps, the most important use of stimulants in protracted typhoid fevers. Nature is eliminating the poison in her own way; we sustain the strength, combat the immediate " tendency towards death," and thus give her time to do this. So in the processes of local disease. Almost every one of those events grouped under the name inflammation, may threaten immediately to destroy the part attacked, or life itself. Of course, as these occurrences are incidental and various, we can lay down no general proposition as to their curability; when we have means of controlling them, we must do so, and not trust to nature.

Pain itself may cause death. Dupuytren spoke of children dying very soon after large superficial burns, as dying from a " hemorrhagie de sensibilité." In all cases, with a very few exceptions, pain is to be lessened or obviated, if possible. I cannot thus touch on this duty, without alluding to the wonderful instrument for this purpose lately placed in our hands, in the inhalation of the ethers and chloroform. Before this essay meets the eye of its judges, high authority will have spoken at the great national festival of our profession, on the merits of this discovery. But without waiting for this verdict, we can now positively claim that sensibility can be suspended for a short time, and, as a rule, with no serious consequences. The fact, in its various applications, strongly rebukes the scepticism which would reduce medicine to a mere curious contemplation; and gives the brightest encouragement to hope, that science, while it develops the resources of unaided and unthwarted nature, will also add to the list of cases where art may interfere usefully.

II. The *vis medicatrix naturæ* is not to be trusted by itself, when a known cause of disease exists, which we can remove.

Sometimes, removing the cause is only giving nature a fair chance to act, though very active interference may be needed for this end. Instances are, foreign bodies lodged within the organs (including worms, sequestra, decayed teeth, &c.)—a poison which we can neutralize chemically—any irritant which we can remove from an internal surface or the skin—bad hygienic influences of air, temperature, moisture, food and drinks, clothing, position, physical exercise, mental or moral habits and states. To get rid of these, is only to clear the ground for nature's healing powers to work. How much this may do is evinced, more strikingly than by any other example, in the treatment of scurvy. A disease that taints the whole system, yields to a mere change of diet.

But when the cause of disease springs from some previous derangement of structure or function, if we then actively interfere to remove it, this is not properly trusting the *vis medicatrix naturæ*. Some such causes act mechanically in part, and their operation is best understood. Thus, stricture of the natural outlets leads to retention of liquid in the deeper cavities, and always tends to produce change of structure there. The effects of pressure of tumors, impeding venous circulation, congestion, serous effusions, varices, &c., are familiar examples. But no mechanical derangement can long disturb the living machinery without calling forth re-actions dependent on *vital* laws; and often we cannot explain the very first step of disease by mechanics or chemistry. The vital causes are less understood, but not less important as furnishing indications of treatment. In many cases, the consideration of them is all that gives our treatment a rational character, all that raises it above a mere set of empirical rules, or above systems of practice, like homœopathy, which profess to see in diseases only groups of symptoms.

As a pure instance of alarming symptoms produced by a known cause, in accordance with known laws of physiology, and yielding when the cause is removed, I may name the disorders that accompany teething. Other such effects produced through the nervous centres, are the wandering pains, often relieved by depletion or irritants over the spine, and ascribed to "spinal irritation"—traumatic tetanus—hysteria from uterine derangement. The over-action of one organ or set of organs may follow from deficient action in some other organ or system, connected with the first, as parts of the same apparatus, or as complementary in function. Such instances are the increased action of heart and arteries in anæmia, sometimes offering a deceptive appearance of strength, and leading to most unpleasant mistakes of diagnosis—the increase of secretion from mucous membranes when that of the skin is checked, or of the liver when breathing is impeded.

Now in a large proportion of these cases there is no natural tendency towards a cure. In glancing over the few instances I have named, it will be seen that the secondary disorders often tend to aggravate the original ones which caused them. The animal functions are so mutually connected, that new derangements in one part re-act injuriously on other organs. In those cases, where a cure by *conversion* seems to be attempted, very often the new remedy is worse than the original disease. An ascites or pleuritic effusion sometimes disappears in a night; it is just as likely to be succeeded by effusion in the cranium and death, as by watery diarrhœa or any other comparatively harmless discharge, and recovery. The *vis medicatrix naturæ* acts not by intelligent immediate superintendence of each case, but by general, unaccommodating laws. Again, if we attack the effect alone, we only throw back the first disease on the system with new force. We must watch the re-actions that are set up, see that they are not too violent or in a harmful direction; but when the cause can be safely removed, we can then interfere to advantage.

III. We may sometimes supply the necessary conditions or stimuli to those actions without which health cannot be restored, or which are impaired by disease. Often nature, by means of appetite or instinct, gives a hint of what these conditions are; and in obeying this hint, we may be said to be only trusting nature. But often she does not do this; and we have a true physiological indication for treatment. Thus, the blood cannot do its duties rightly without a sufficient proportion of iron. In certain diseased states, the blood is wanting in iron. This state tends to perpetuate itself; the poor blood causes all the processes of nutrition to be ill performed, and this, in turn, keeps the blood poor. Physiology and the observation of every physician teach the usefulness of supplying the needful stimulus. The effect of introducing iron into the system is permanent, for the same reason which makes that of anæmia permanent. The nervous system acts more vigorously—the stomach digests better—the capillaries, where nutrition proper goes on, receive the stimulus they need. Yet I have known a pale and suffering female long deterred from supplying this necessary element to her system, because of the re-action that must follow!

The same advisers who condemn as unwarrantable presumption, and sure to be followed by retribution, this use of iron, or supplying to the blood its deficient part, speak of the harsh applications of hydropathy as merely seconding nature. The use of cold water, particularly by the shower bath, and in sea bathing, is undoubtedly of the highest value in chronic anæmia, when it is well borne. But the violent modes of applying water are not at all what we understand by trusting nature. No instinct or appetite leads to them; they are harsh at first, and do harm except as the system, by its inherent preservative power, re-acts against their immediate shock. Practices which bring out *crises*, "of six inches, with thirty-two heads" (anthrax), which wring from their saturated martyrs sulphur and mercury swallowed twenty or twenty-eight years before*—are something more than merely seconding nature.

IV. We frequently interfere actively to excite particular functions by unusual artificial applications; we give cathartics, diuretics, &c., either directly to excite functions which are ill performed, or for some further end. Or, we use general stimulants to excite many functions at once.

It may seem a truism to say that we ought to be sure, before doing this, that we shall do good and not harm—and that our evidence should come either from actual observation of similar cases, or from what we know of the dependence of functions, or both. Yet I think physicians are often deceived by employing terms which seem to explain the reasons for certain strong measures, but which in truth give no explanation at all, and are good for nothing, unless as the facts they pretend to account for are well ascertained. Thus we hear of emetics being given to "break up the train of morbid actions," in cases of threatened fever, or phthisis. If emetics are useful in such cases, let us accept the fact, joyfully, but let us not mystify either doubtful or certain truths by unnecessary, pseudo-theoretical words. Phrases like the above may easily seem, in the physician's mind, to represent principles much wider in their application than the facts on which they are based.

A most important source of fallacy is overlooking the secondary effects of medicines. Exciting any function will be followed by depression, requiring stronger stimuli another time. Many medicines which immediately relieve urgent symptoms make those symptoms more likely to recur. Antimonials added to expectorant mixtures make the bronchial secretions more liquid, and lower the frequency of breathing, and thus promote the patient's comfort. But if these mixtures are taken for a long time, the antimony causes a feverish irritability, acts as a poison to the nervous system, and alters the constitution of the blood. This last fact explains its usefulness in inflammations, with abundant plastic material. Some remarkable cases of hemorrhage, and a condition allied to the scorbutic, following the use of antimony, are published by Dr. Peebles, of Virginia, in the American Journal of Medical Sciences for the present year. This whole subject of the secondary effects of medicines calls for renewed investigation.

---

* See "The Cold Water Cure, as practised by Vincent Priessnitz," &c. By Richard Beamish, Esq., F.R.S., &c. &c.

V. The *vis medicatrix naturæ* should not be left to itself, when a disease exists which we have specific remedies to control. There are exceptions to this statement, since there may be contra-indications to any remedy whatever.

Scarcely a stronger instance is known of the power of medicine to really stop morbid processes, without seeming to affect any function, than the use of cinchona in intermittent fevers, uncomplicated by local inflammation. Still the prognosis of simple intermittents is usually very favorable, without treatment. "Severe tertians," says Hippocrates, "determine themselves at farthest in seven paroxysms."* Dr. Eberle, whose opinion on such a subject is of great value, says—"Quotidians, if they are simple and regular, will tend to terminate their course on the seventh day, and tertians on the fourteenth. Quartans will generally run on to the sixth week. The disease will not terminate spontaneously at these periods, but its tendency to do so will be such that, if assisted by a proper febrifuge, it will not only more certainly be arrested, but a relapse will scarcely ever occur, unless the remote cause continues to act on the system."†

Pinel, one of the most accurate and truthful observers of nature, gives us the following results of his own observations in tertian fever. "I abstained from the well-known specific, cinchona; and confined myself to the use of some indigenous bitter herbs. It resulted from my first tabular summary, that of 60 cases of tertian, 36 recovered by the 11th paroxysm (at the 3d, 4th, 5th, &c.); that of the remaining 24, some stopped at the 10th, 14th, &c.; that the most obstinate only, to the number of four, continued to 31 or 32 paroxysms. In the whole 60, only 8 suffered a relapse."‡

Dr. Eberle usually prefers to delay using the specific, till the period when the intermittent would of itself tend to cease. When a tendency to relapse exists, this is particularly important. "I have found agues, arrested after the first or second paroxysm, relapse again and again, until they were suffered to run on to the fifth or seventh day, when a few doses of quinine put a permanent stop to their progress."* Recamier advises a similar course. The experience of these physicians is worth much more than the fears formerly entertained, on theoretical grounds, of stopping the natural process by which the poison is being eliminated, and thereby increasing the danger of local congestion afterwards.

---

* Aphorism, iv., 59.

† Eberle's Practice, i., 109.

‡ Diction. des Sciences Medic., xiv., 253.

VI. Among acute diseases, one class, as yet of uncertain limits, comprehends affections which run through a definite course, varied by varieties of constitution, but little influenced by art. When nature has been compromised by the attack of these diseases, she seems to have a set of actions to go through with, which we cannot assist except indirectly, and cannot to any good purpose check. Such are the first class described by Dr. Bigelow, in his essay on self-limited diseases—called by him the ***simple self-limited*** diseases. Their type is found in the non-recurrent contagious eruptive fevers—measles, scarlatina, variola. In these, art does little more than regulate hygienic influences, and this generally in accordance with the natural inclinations, allay incidental bad symptoms, watch for complications, and sometimes sustain the strength while nature is working out a favorable recovery. In these diseases, in smallpox especially, a desire to second the ***vis medicatrix naturæ*** has at different periods shown itself in two opposite ways. Formerly the disease being viewed as an effort of nature to throw out a morbid humor, heating and stimulating measures were used, because they favor the eruption. In smallpox this course is now seldom followed. In measles, internal stimulants are still very commonly given—are they not too indiscriminately? I have lately noted the appearance of transient delirium, and very marked stupor, ceasing as the domestic draught of saffron tea was stopped. In scarlatina and variola, a more rational way of seconding nature is by obeying the indications she herself gives—by gratifying the desire for cold.

As irregular members of the same group with these eruptive fevers, may be named our common typhoid fever, acute erysipelas and other erythemata attended with fever, herpes zoster, &c. They cannot be materially shortened by any known treatment; though the erythemata may be limited in their spread from place to place.

Some measures have been recommended as stopping typhoid fever at its beginning. It must be very difficult to establish such a fact, as the diagnosis of the disease at its first onset is always doubtful, and, during an epidemic, cases often occur much resembling it, but subsiding in a few days. Dr. Christison (Lib. Prac. Med.) says, "It is doubtful whether a true continued fever may be cut short at its onset by any means." Louis says, "Experience has shown that well-characterized typhoid is not susceptible of being cut short." Dr. Nathan Smith considers such cases doubtful, and says, "all powerful remedies or measures made use of in the early stage of the disease, are very liable to do harm, and those patients who are treated with them in the beginning of the fever, do not hold out so well in its latter stages." This view was the result of wide observation, as well as of his theoretical idea of fever as a specific disease.

---

* Eberle's Practice. i., 118.

Emetics are the measures most commonly employed in my own observation to cut short typhoid fever. There is more evidence, however, in favor of the effects of cold affusion. Some of the cases reported in Dr. Currie's very valuable work, look as convincing as the nature of the case would well allow; but his cases were marked by stronger cerebral symptoms, and less of a typhoid character, than the average of continued fevers in his or our country. Cold affusion with us is seldom used except as a refrigerant, and particularly for delirium or severe nervous symptoms.

I have already hinted that it is doubtful how far this class of diseases extends; it is probable more will be brought within it, as diseases come to be more studied as objects of natural history. Very many diseases of irritation exhibit the over-excitement of some functions rendered necessary by a previous cause, which cause must be attacked first. But those diseases of irritation, in which the consequence lasts though the first cause is removed, so far as we can remove it, may perhaps be brought under the head of self-limited diseases. Such are confirmed epilepsy, tetanus, delirium tremens.

In regard to the last of these affections, much difference of opinion prevails as to the usefulness of opium. That sleep is a most favorable occurrence in the paroxysm of delirium tremens, is well established. That under very different modes of treatment it is very generally obtained within three days, is also well known. But the researches of Dr. Ware, of Boston, have illustrated the natural course of the paroxysm, showing that under these various methods of management it in fact took its natural way, and that, under a purely expectant plan, the desired sleep is very generally obtained within 60 to 72 hours, in uncomplicated delirium tremens. Nay, more, the fatality and duration were both increased in cases where sleep was forced by opium in large doses (giving 24 to 72 grains in the course of 48 hours), or where small doses were given, not enough to have any great influence in procuring sleep (two or three grains in 24 hours). This belief, first announced as the general impression left by a pretty extensive observation, afterwards appeared in the more trustworthy form of the results of numerical computation. (See the subjoined table.*) Dr. Ware's researches show that sleep, particularly if forced by art, is in a considerable proportion of cases not immediately followed by recovery, and sometimes occurs in cases that still prove fatal. In delirium tremens, not complicated by other disease, and not occurring in constitutions broken down by long-continued excesses, he decidedly recommends that no powerful means be used to procure sleep. The papers of Dr. Ware on this subject are favorable specimens of what may be done to illustrate the treatment of diseases, by

---

*	No. of cases.	Bled.	Died.	Recovered.	Complicated with acute disease.
Opium, large doses,	8	0	4	4	1
Opium, small doses,	7	1	2	5	1
Emetics,	12	1	1	11	2
Bleeding,	2	2	0	2	0
Eclectic,	9	5	3	6	7
Quinine,	1	0	0	1	1
Mercurials,	1	0	0	1	0
Expectant,	29	4	1	28	1

studying their natural history. The results are interesting, as showing a case of pure irritation, not stopped by removing the cause, and that runs itself out, if not interfered with, more safely than if we try to quiet the irritation. In the treatment of this class of diseases, generally, more can be accomplished by allaying the irritability, and attacking the predisposing causes, than by directly trying to subdue the existing excitement.

VII. Inflammations figure so largely among the diseases we are called to treat, that they deserve special consideration here. Much breath and ink have been wasted, in inquiring whether inflammation is or is not a restorative process. The question has been discussed most intelligently with reference to inflammation following mechanical injuries, where we can get at more of the elements of the case, than in internal diseases. It has been satisfactorily shown that inflammation is not necessary to the healing of wounds, but is in many instances a hindrance to the true reparative processes. It is matter of observation that wounds may heal without redness or heat, without pain except what is left from the injury, without accumulation and delay of blood in the capillaries, or increased action of the arteries—and that healing beneath a scab, or by the so-called modelling process, is interrupted when these signs of inflammation appear. Sometimes, on the other hand, wounds or ulcers will not heal till the organizable elements of the blood are specially increased, as by inflammation. So in internal diseases—after ulcerative perforation of the intestine, inflammation is the great source of danger if it spread along the peritoneum, and at the same time the only safeguard if it stop after sealing up the opening by lymph. Inflammation is not essentially and constantly either restorative or hurtful.

But it generally tends to spread along continuous textures; we can seldom be sure, except in certain specific cases, that it will not go on to disorganize the part it occupies, or permanently disable this part; it makes the part more liable to inflame again; it affects the constitution of the blood, and the powers by which its elements are produced; it tends to produce secondary inflammations in other parts. This last fact has been most fully brought out by the researches of M. Louis. Then inflammation may by each of its processes do immediate immense harm, may block up the air-cells in the lungs or the lining of the glottis, may deposit an opaque spot in front of the pupil. Its tendency to propagate itself, and run on into further evils, makes it one of the worst forms in which the power of re-action can show itself. Practically, there are very few cases in which it is not desirable to check or moderate inflammation.

How much we can do to cut short the series of actions grouped under this name, is doubtful. As the means most confidently recommended, let us consider the effects of bleeding. Nowhere has the fallacy more prevailed of overlooking the secondary, in the immediate effects of treatment. Some practitioners and writers speak very confidently of stopping or shortening inflammation by bleeding. "In many cases of cynanche tonsillaris, an early and full bleeding will have the effect of arresting the inflammation, and thus of saving the patient from much suffering if not danger. Even when the arrest of the disease is not effected by it, the inflammation is reduced in violence and shortened." I quote the above (from Condie's notes to Watson's Lectures on the Practice of Medicine) to show the off-hand, confident manner in which many physicians, those of the English school particularly, speak of inflammation as controlled by bleeding. On the other hand, certain French observers of this century set forth, as the result of facts, observed with most patient industry and marshalled in tabular views, that with them bleeding seldom cuts short, and has a slight power of shortening, or rendering less fatal, many inflammations where most good is commonly expected from it. And certainly, the observations from which these inferences are drawn deserve great confidence, from their completeness and conscientiousness. Impressions remaining on the mind, not confirmed by detailed records of cases, are more to be relied on as showing the immediate, striking results of a remedy, than the after-effects, the secondary re-actions, the sum of all the successive changes this remedy calls forth, and their aggregate influence on the disease in its whole subsequent course, and on the health in after-life. Now, we have ample testimony—every physician has it from his recollections—that bleeding may immediately relieve urgent symptoms, and in this way may save life or an important organ. This comes under a head we have already considered. It is quite another question, how far it can control the whole after course of those morbid processes called inflammation.

I believe that in this country the habit of recording all cases of disease is not so general as in some other parts of christendom; and that we judge too often from vague impressions of facts that have been observed, recollecting most vividly, of course, the striking results of remedies. It may not be amiss, then, to note observations made eleswhere, in centres of science where the "numerical method" is more highly honored. It is gratifying to find they confirm the belief which has been bequeathed to us from past centuries, and which the scepticism of a few years can hardly shake. The statistical results which I wish to quote, relate to acute pneumonia. In this disease there is a double indication; bleeding lessens the duties required of the diseased organ, as well as the force on the general circulation.

The first work of Louis on this subject[*] gives the result of 78 cases of pneumonia, observed by him at La Charité, in Paris; of these cases, 28 were fatal, or a little over one third. The following table shows what relation existed between the time of the first venesection, and the duration of the disease, in those cases which recovered.

Day of 1st Bleeding.	1	2	3	4	5	6	7	8	9
	10 3	7 3	19 3	19 3	28 2	13 1	24 2	19 2	35 1
	12 2	10 2	29 3	12 2	17 3	16 2	12 4	12 1	11 2
	14 2	12 2	20 2	15 2	40 2	23 3	19 2	18 1	17 2
			20 2	22 4	13 5	35 5	18 2	20 3	30 3
			16 3	12 4	21 2	17 2	15 2	13 2	
			17 4	21 2	13 2		27 2	21 2	
				25 3					
				28					
				40 2					
				16 2					
				12 4					
Average,	12 2 1-3	10 2 1-3	20 3	20 3	22 2 2-3	21 2 3-5	19 2 1-3	17 2	23 2

---

[*] Recherches sur les effets de la saignée dans quelques maladies inflammatoires. Paris, 1835.

In each of the preceding columns, the figure at the top indicates the day when the first bleeding was made; below, the left hand figures indicate the duration of the several cases, the right hand figures the number of bleedings in each case.

In making two groups of these cases, group No. 1 consisting of those bled as early as the fourth day, group No. 2 of those not bled till the fifth or later, we should find the average duration of those in group No. 1 not quite 18 days, of those in group No. 2 a little over twenty. Those of group No. 2 had one incidental but important disadvantage—they were not brought under a proper regimen so early as the others. Very similar results follow from the records of twenty-nine cases observed at La Pitié, Paris, by Louis. The several symptoms had a duration proportioned to that of the disease itself, being decidedly amended after bleeding, mostly in those instances where bleeding was practised near their natural period of subsidence.

The important conclusions from his researches are thus expressed by M. Louis, whose cautious spirit of induction may better be trusted than others who may deal with his facts. "First, Bleeding has a favorable influence on the course of pneumonia; it shortens its duration; this influence is, however, much less than is commonly supposed, so that patients bled in the first four days of the disease recover, other things being equal, four or five days sooner than those bled at a later period.

"Secondly, Pneumonia is not cut short by bleeding, at any rate in the first few days of the disease. And, if the contrary opinion has been held, it is doubtless because this affection must have been confounded with some other; or because, in some rare instances, the general symptoms rapidly lessen after a first bleeding. But even then the local symptoms none the less continue to advance, in most cases."

M. Grisolle gives very similar results from observations made in 1836.* In 18 out of 50 cases, bleeding produced a more or less rapid amelioration in the inflammatory symptoms. As to the remaining cases, in 18 the disease made rapid progress, in spite of the bleeding, while in 14 it remained stationary at the same degree of severity; so that the influence of bleeding on the course of the pneumonia was null or doubtful. In no case, by the most profuse bleeding, was a severe pneumonia cut short, when treatment was begun on the first few days of the disease. The researches of M. Grisolle confirm those of Louis, with regard to the influence of bloodletting on the duration of the disease and of the characteristic symptoms, and also as to the greater usefulness of bleeding when practised early.

From many parts of continental Europe, accounts reach us of hospital practice there, in which the usual active measures recommended in all our text-books are not employed. Acute pneumonia is placed under good hygienic influences, and left in the hands of nature, with some nominal medicament, to amuse the mind, and secure obedience to the hygienic rules imposed. Such is the treatment of Magendie, at the Hotel Dieu of Paris. In Germany, where homœopathic management has been quite common, an expectant course is often followed in certain hospitals. The comparative results of homœopathic treatment under Fleischmann, and of treatment by Skoda, with a little *extractum graminis*, and occasionally experimental remedies thrown in, are given in the British and Foreign Medical Review for October, 1846. Of 19 cases under Fleischmann, having an average of 24 years, 3 died; of 45 cases under Skoda, 3 died. In acute inflammations, venesection had for three years been rarely used by Skoda, other modes of bleeding not at all; average mortality, 13.7 per cent.; average age, 25.3. The great advantage of not bleeding is, in his opinion, the more rapid recovery. The results of treatment in these two hospitals at Vienna have derived an interest from the wide publicity given to those of Fleischmann, as specimens of the superiority of homœopathy. The paper in the Review referred to, is by Dr. G. W. Balfour, of Edinburgh, who observed the cases himself, and shows that the average results of treatment almost or completely inert, with attention to hygienic rules, were more favorable than those exhibited in Fleischmann's published tables, notwithstanding several incidental circumstances that gave the latter an advantage. The diseases presented a less sthenic character than those of Great Britain.

---

* See Journal Hebdomadaire.

Magendie, in his wards at Hotel Dieu, Paris, has seldom used the lancet for some years past; the same is the case in the House of Industry at South Boston, though severe cases of acute pneumonia frequently occur. I have thought the above results of observations in other places might be presented with advantage to physicians in our own State. I should be sorry to be supposed to think that they warrant any of us in this day in setting aside opinions sanctioned by so long experience, under such varied influences, and under so competent observers, as those which inspire confidence in the use of bloodletting.

CEREBRO-SPINAL MENINGITIS.

[Communicated for the Boston Medical and Surgical Journal.]

This disease has prevailed to a frightful extent, for the last four weeks, in the towns of Sutton and Millbury, in this State. The first case was that of a boy 10 years of age, in Sutton. He was suddenly attacked with entire prostration of reason, delirium, intense pain, spasms, great coldness of extremities and whole body, with collapse of the vital energies. After a rather imperfect re-action had taken place, petechia, or a mottled state of the skin and surface, made its appearance, which led to the conclusion that the character of the disease was a more aggravated form of typhus, or the spotted fever that ravaged portions of New England in 1810 and subsequent years. But other cases occurring in rapid succession, and with such fatality, led to the suspicion of a more alarming and deadly disease than even that fatal malady.

The prevailing features in this epidemic are strikingly coincident with that which has prevailed so extensively and fatally in France and Ireland, and other portions of Europe. The majority of cases have been among boys, but according to the number, more male and female adults have been its victims than in Europe. One case, a boy, 5 years old, terminated fatally in the short space of ten hours from the time of the first-discovered symptoms; one case in thirteen hours; and others in twenty-four hours. This, added to the circumstance that males and females of upwards of 60 years have been its victims, would make it appear to be of a more mortal character than either of the epidemics of Europe—as the shortest period there of termination, out of hundreds, was fifteen hours.

With one or two exceptions, every patient has been suddenly prostrated with loss of reason, rigors, extreme coldness of the extremities and lividness, loss of vital warmth, pulse small and thready, severe pain, convulsions and spasms, especially of the neck, attended with rigidity. The state of delirium and restlessness has been so extreme in most cases, as to require from four to six attendants to restrain the patient. In those patients that continue for three or four days or more, re-action, more or less perfectly, takes place; the pulse is irregular, small, tremulous and intermitting; the pupils dilate or contract, according to exposure to light; the delirium gives place to coma; "the *powers of speech and deglutition fail*"; the teeth become covered with a foul sordes; the breath offensive; typhoid symptoms, more or less severe, take place, and death closes the scene.

Fourteen deaths occurred in rapid succession, before any *post-mortem* examination could be obtained. This was a case of a male adult, which terminated on the thirteenth day—of longer duration than any previous case. The symptoms at times were so far mitigated as to afford hopes that convalescence would permanently take place; but the flattering and lucid spells proved short and transitory. The same state has been manifested in others. In this case, the vessels of the arachnoid were engorged with dark blood, and the entire membrane covered with a thick purulent matter. Sero-purulent matter was found in the ventricles and at the base of the brain. The medulla oblongata and spinal cord partook of the same lesion and showed the same traces of diseased action. No lesion was found either in the lungs, thorax or abdominal viscera. The stomach and bowels appeared healthy, discovering neither inflammation nor ulceration. The results in this case showed most unequivocally the disease to be that denominated, in Europe, cerebro-spinal meningitis. As all the other cases, although not examined autopsically, strictly resemble this, and each other, in all their leading features and symptoms, it may with propriety be considered to have received its proper appellation.

The case of the boy, 5 years of age, Mr. Hall's, which terminated in the short space of ten hours, although the most suddenly fatal, was not taken so violently as either of the others; delirium did not come on until within three or four hours of death. He was sent to town in the morning and was measured for a garment. During this time the lady noticed he appeared very cold and shivering. A degree of debility was so manifest that assistance was necessary to extend his arm to finish the measurement. The child, during all this time, made no complaint. Yet the rigors and coldness appeared so great that the lady was more than half inclined to suspect it might be feigned. He went home himself, when every symptom became more and more aggravated, and death took place at 6 o'clock on the same evening. All remedies and means used were utterly unavailing; re-action could not be produced, and never took place; the first collapse proved a fatal one. In this case the disease run its course in so short a time, that much lesion might not be expected; and though every part was examined scrutinizingly by twelve physicians, it was hard to account for the cause of death, so little diseased action was manifested. As in the other case, great vascularity of the arachnoid was prominent; the substance of the spinal cord, instead of being indurated as in the other case, was softened almost to a pulp. No purulent matter was found either in the ventricles or the base of the brain, or spinal canal. The viscera throughout, with the stomach and bowels, were in a perfectly healthy state.

The question naturally arises in this case, where did death commence, what its character and cause? That it is an epidemic having its cause in the atmosphere, there can be no room to doubt. But why such a deadly epidemic should here arise and hover around this small extent of country, without seeming to spread, there is no means of knowing. There is apparently nothing in the geographical and physical situation of the country, to generate any such cause, any more than in the neighboring towns. ***But what can be its cause?*** That it is a miasmatic or aerial poison, of a most subtle and deadly nature, every case combines to prove. From the very consideration that every case has been suddenly attacked without any premonitory symptoms, in apparent good health, the striking similarity and uniformity of every symptom, and the onset of the malady, all go to prove this in a most conclusive manner. The characteristic features in every case are such as to show the effect of some sedative and deadly agent upon the cerebro-nervous system. The sudden and extreme collapse, great agony, and indescribable restlessness, that are so uniformly manifested in the congestive fevers of the *miasmatic* districts of the western and southern States, show the cause of the two diseases to be one and the same. But the question will be asked, why is its force of action and lesion confined to the meninges in this disease, any more than in the general congestive fevers of the malarious districts? This problem we are unable to fathom. We have witnessed death as suddenly in congestive fever of the WEST, as in the case above mentioned, when no lesions or disorganizations could be found; only an engorgement of the bloodvessels of the vital organs, and functional derangement. A poison so sedative in its nature as to paralyze all nervous energy and sensibility to external feeling, is sufficient to suspend the muscles and powers of respiration, arrest the flow of blood to the heart and brain, and produce death by *apnœa*. In this way we account for the death in the boy whose case is detailed above. That death may be occasioned by the mechanical disarrangement and impediment of the vital machinery, by the sedative action of malaria or other deadly poison, paralyzing the vital energies of the nervous system, is well known to every physician who has practised ten years, either in the southern or western States, however much the idea may be ***sneered at here.***

Every case thus far has proved fatal, amounting to nineteen or twenty; and no plan of treatment has yet been attended with any success, either in arresting its progress or modifying its paroxysms. We should repose some confidence in liberal doses of the sulphate of quinine, administered immediately on the development of the disease, aided of course with strong counter-irritants or the actual cautery itself. All suggestions, however, of this nature, may seem gratuitous at present, as in all probability some further notice will be taken of this epidemic. A. Stone, M.D.

Auburn, Mass., March 30, 1849.

THE BOSTON MEDICAL AND SURGICAL JOURNAL.

BOSTON, APRIL 11, 1849.

Meeting of the American Medical Association.—Fortunately for the Association, the legislature of Massachusetts have granted the use of the State House, in Boston, for the approaching anniversary. The location is not only exceedingly imposing, affording a grand panoramic view of surpassing beauty, but the elegant accommodations within, in connection with numerous committee rooms, besides the attendance of a corps of trained pages, to keep everything in good condition during the session, induce us to believe that in this respect our distant medical friends will have no cause for complaint. Dr. Bowditch, the Secretary, is constantly receiving names of delegates from abroad, while the reception committee are active in arranging the business confided to their care. From present indications, there will be a gathering of the profession from Texas to Maine, and from the Atlantic border to the territory of Menasota.

Fracture Tables.—That persevering man, Dr. F. H. Hamilton, of the Buffalo Medical College, has brought out, in a pamphlet, the results of treatment in one hundred and thirty-six cases of fracture, under the title of *Fracture Tables.* There are too many columns of figures to grapple with, or a large part of the work might have been transferred to these pages; but, though we cannot publish his researches, in detail, it is due to the activity, skill, and ingenuity of the author, to say that he is destined to become very prominent authority in Western surgery. For the purpose of determining the average results of treatment in fractures, he collected one hundred and thirty-six cases from various sources—from hospitals, charities, private practice, and the Colleges of Western New York. An especial object was to make the tables, in the language of the industrious inquirer, a fair representation of the results of the practice of skilful surgeons. Dr. Hamilton says that a shortening of half an inch in the lower extremities, will frequently produce a manifest halt, while, on the contrary, he has seen a shortening of an inch entirely concealed in the gait. Within a small compass, in the modest form of marginal notes, a very curious collection of practical hints and facts are accumulated, which will prove acceptable guides to practitioners of surgery, in the way of showing precisely how certain kinds of fracture were managed, and the phases they assumed in the progress of recovery or degeneracy. With these observations, we recommend these tables to the consideration of those at all interested in operative surgery.

Ship Fever—Cause and Prevention.—Messrs. Fowler & Wells, of New York, have published the sanitary regulations to be observed on ship-board, written by the late Dr. Andrew Combe, of distinguished memory. It is not a new thing, but an excellent old one, reprinted here for popular reading. But as emigrant vessels usually come from England to the United States, the disease of which the paper treats being almost exclusively confined to Irish emigrants, the great market for this reprint would seem to be at Liverpool, Dublin, Cork and Galway, instead of the United States. Still, the disease creeps insidiously into the interior of our country, follows the rivers and canals, and in short pursues the emigrant in all his travels, and in its course sweeps off great numbers of our citizens. If people most exposed to the influence of ship fever would read and be influenced by the wholesome advice inculcated in this and some other similar productions, human suffering would be very much mitigated, and human life prolonged. But, alas! all cannot read; nor will those who can, always profit by the admonitions of benevolent physicians.

Congressional Minority Ether Report.—This document, signed by the Hon. Fred. W. Lord, of New York, and Hon. John W. Jones, of Georgia, is of peculiar interest. Those who have had the first, should by all means peruse the second. A mass of testimony is brought together in relation to the early discovery, experiments and suggestions, on the matter of etherization. Nothing has made a greater sensation in the world of science, since the promulgation of the benefits of vaccination, than this extraordinary discovery. We understand that Dr. Jackson is well satisfied with this report. A more remarkable controversy than this does not belong to the history of medicine. But our readers are not generally desirous of seeing more of it in the Journal. One of them complains, in a letter, at the space which has been given to the subject, and adds—"I candidly feel that the abettors of these ether gentlemen are under solemn obligation to make their *amende honorable* to the profession, as a body; they may soon have the opportunity, through the convention now expected at Boston. If wrong, I am willing to be made right; but these are my thoughts, and I have read more than I will do again, unless I alter from my present determination."

University of Missouri.—Thirty-eight students of the medical department of this University were recently graduated, with the degree of doctor in medicine; five admitted *ad eundem*, and honorary degrees were conferred on Drs. Henry C. Wright, of Missouri; J. W. Hollowbush, of Illinois; G. Jayne, do.; W. B. Maxon, of New York; and Herod W. Hudnell, of Missouri. The discourse of Thomas Barbour, M.D., Professor of Obstetrics, &c., on the occasion, was in keeping with his reputation for strong practical good sense, and it appears to have been received with much satisfaction. It is replete with beautiful passages, wise suggestions, and abounds with those elevating sentiments on which professional reputation and usefulness necessarily depend.

Baltimore Dental College.—Valedictories are becoming as common as introductories at all the schools of medicine and their collaterals. It is a good idea to make an impression on the plastic minds of youth, as they are launching their bark upon the broad ocean of professional life. Beginning with the imperative command—*know thyself*, Dr. Cone, Demonstrator of Practical Dentistry in the Baltimore College, pronounced a valedictory that is full of sound doctrine, good sense and every-day philosophy. It is a rare quality to be able to say excellent things on appropriate occasions, which this gentleman has admirably accomplished. The degree of interest we have invariably felt in the success of the College of Dentistry from the beginning—which was regarded with distrust by scores of distinguished dentists—has never been concealed, and is still retained.

Electropathic Guide.—A half-yearly journal of 138 pages, devoted to electricity and its medical applications, by Dr. A. Paige, was recently published by Messrs. Damrell & Moore, of Boston. It contains a singular collection of facts, illustrative of the value of that mighty agent in nature. As the profession are fully persuaded of the value of this mode of treating many diseases, it would be strange if the public did not peruse this guide with much interest.

Buffalo Hospital.—Of the necessity for the establishment of a hospital of the first class in the great and growing city of Buffalo, no one at all acquainted with the locality of the place, its immense lake commerce, the traffic of the canal—giving employment to thousands of men—can doubt. A project for the accomplishment of an object so desirable, in which it would seem that all persons of ordinary benevolence could unite, was progressing very favorably, when the wheels were quite unexpectedly clogged, for a time. A few medical gentlemen have distinguished themselves by a remonstrance to the Legislature against an endowment, if not a charter. This is represented by themselves to have been done in the fear that the professors of the medical school would have too controlling an influence over the hospital, and make it a tool for their personal thrift and aggrandizement. Surely, if the hospital is ever brought into being, it must be admitted that the teachers of medicine and surgery would be the most competent persons that could be selected for serving the patients. It is a narrow-minded policy that stands in the way of a decided public benefit, for fear that by some possibility it should become a monopoly. There can be no baneful permanent monopoly in this country. Oppression and selfishness are soon discovered, and promptly overcome.

Calisthenic Chest Expanders.—An ingenious instrument is manufactured in Boston, for enlarging the capacity of the chest, of which Messrs. Philbrick & Trafton, druggists, Washington street, are agents. For persons of sedentary habits, students, clergymen, book-keepers, clerks, &c., it promises an immense benefit at a trifling expense. Dumb-bells, those ugly, unphilosophical contrivances for making feeble persons unnecessarily fatigued, are quite eclipsed by this simple, yet excellent contrivance. In schools, especially for young ladies, the calisthenic expander should be introduced, since the lungs are the first organs to suffer where numbers are confined to one apartment. As preventives of such a result, ventilation and the species of exercise required in the use of this instrument are invaluable, and should go together.

Dr. Carter's Pulmonary Balsam.—To the Editor. &c. Sir,—The following is the composition of a medicine called "Dr. Carter's Compound Pulmonary Balsam." Rad. Senegæ, scillæ, sanguinaria, glycyrrhiza, aqua, saccharum, vin. colchici, citrate of morphia, tinct. bals. tolu, tart. antim. et potass., prepared in the form of a thick syrup; the anodyne properties of which are about two thirds of the strength of the camph. tinct. opii of the U. S. Dispensatory. I first prepared the medicine for my own use in practice, without expectation that it would be further extended. The recipe passed into the hands of Messrs. F. & H. Keyes, by whom large quantities have been sold in the United States and the Canadas. I never designed it to be a secret remedy or nostrum; but as it has passed off as such among the multitude of preparations which throng every part of our country, I wish to say to the medical profession that I deprecate secresy in medical practice, and nostrum-making in any form, and with such I have nothing to do.

W. H. Carter.

Newbury, Vt, March, 1849.

Medical Miscellany.—A Dr. Hatch has been arrested at Philadelphia for counterfeiting.—Forty cases of smallpox have recently appeared at Norfolk, Va.—An improvement has been made in the microscope by B. Haseart, Cincinnati, which, it is said, immensely increases its power. The Cincinnati Commercial speaks of it as a great scientific discovery—the benefits of which are incalculable.—Dr. Scheiber, of Stockholm, it is said, has succeeded in curing drunkards of an appetite for spirit, by giving them all their food and drinks mixed with brandy, tea and coffee.—Cholera has broken out at Quincy, Illinois, producing considerable excitement.—Dr. Jewett, the well-known temperance lecturer, has removed to Millbury, Mass.—A medical college has been fully organized at Evansville, Indiana. The first course of lectures will commence on the first Monday in November next. Drs. Weever, Foster, Wilcox, Bray, Laycock, Walker, Lane and Trafton compose the faculty.—No recent cases of hydrophobia have been developed in this neighborhood, of late, and the excitement, therefore, has subsided.—Eye and Ear Infirmaries appear to be on the increase.—The bill authorizing the erection of a second hospital for the insane, was debated in the Massachusetts Legislature by Messrs. Giles, Rider, Sargent, Nelson, &c., on a motion made by the first-named gentleman to amend it so that the money to be appropriated for the purpose shall be raised by a sale of western Rail-road stock instead of by loan. The amendment was rejected, and the bill was then rejected, 17 to 18, by yeas and nays.

To Correspondents.—Dr. D. King on the Treatment of Fractures and Dislocations, No 3 of Sketches of Eminent Physicians, and J. S. J. on the Treatment of Intestinal Worms, have been received. Other papers, which have been excluded from to-day's Journal by the length of Dr. Parsons's excellent Prize Dissertation, will receive early attention.

Died,—At New Orleans, Dr. John Harrison, of the University.—At Pensacola, Dr. Alexander Robinson, Assistant Surgeon, U. S. N.—At New York, P. S. Townsend, M.D., 53.—In Brooklyn, N. Y., Dr. John J. Pendergast, 78.

***Report of Deaths in Boston*—for the week ending April 7th, 91.—Males, 46—females, 45.—Of consumption. 19—scarlet fever, 4—lung fever, 5—puerperal fever, 1—canker, 1—croup, 1—infantile, 10—child bed, 5—convulsions, 3—worms, 2—inflammation of the lungs, 1—disease of the brain, 3—hooping cough, 2—measles, 11—erysipelas, 4—brain fever, 1—dropsy on the brain, 3—inflammation of the bowels, 1—disease of the bowels, 1—disease of the liver, 1—marasmus, 1—diarrhœa, 1—dysentery, 1—paralysis, 1—disease of the lungs, 1—accidental, 2—teething, 1—typhus fever. 1—disease of the heart, 1—intemperance, 2—drowned, 1.**

Under 5 years, 47—between 5 and 20 years, 8—between 20 and 40 years, 26—between 40 and 60 years, 6—over 60 years, 4.

Exhalation of Carbonic Acid Gas.—M. Lassaigne, the well-known French chemist, addressed to the Academy of Medicine, at a late sitting, the continuation of his experiments on the above subject, the first part of which was presented in 1846. The main object of the present inquiry was to ascertain the amount of carbonic acid gas evolved, in proportion to the size of different animals. The experiments were made on a bull, a ram, a goat, a kid, and a dog. From these it would appear that every animal evolves, in an equal time, a different amount of carbonic acid gas, which amount will depend on the particular habit of body, on age, and especially on the degree of respiratory activity of the animal. The following figures represent, by volume, the quantity of the gas which was given off in an hour's time:—

	Eng. Cub. In.*	
Bull, - - -	16,542.52	at 29.64 inch. of atmospheric pressure.
Ram, - - -	3,370.13	" "
Goat, eight years old,	1,310.70	" "
Kid, five months old,	707.83	" "
Dog, - - -	1,117.27	" "

These figures are the results of experiments made upon free respiration in well-closed stables, the area of which was 151.48 cubic feet; or with the smaller animals, conducted in a box provided with panes of glass, the capacity of which was 114.56 cubic feet. The proportions of carbonic acid gas being calculated by weight, it will be found that each of the above-named animals evolved, in one hour, the following quantities:—

	Troy Grains.	
Bull, - - - -	8,297.79	of carbonic acid gas.
Ram, - - - -	1,687.27	"
Goat, - - - -	656.23	"
Kid, - - -	354.27	"
Dog, - - - -	559.33	"

The proportional amount of carbon will be found as follows:—

	Troy Grains.	
Bull, - - - -	2,260.64	of carbon.
Ram, - - - -	460.27	"
Goat, - - - -	178.98	"
Kid, - - -	96.43	"
Dog, - - - -	153.44	"

London Lancet.

Nutritive Properties of Bran.—M. Millon has communicated to the Academy of Sciences the result of some interesting investigations of his concerning the ligneous matter of wheat, whence it would appear that bran is a very nutritive substance. Though bran doubtless contains from five to six per cent. more ligneous substance than flour, it presents more nitrogenous matter, twice as much fatty matter, and moreover two distinct aromatic principles, one of which possesses the fragrance of honey; and these are both wanting in flour. Thus, by sifting the impoverished wheat into nitrogenous matter, fat, fecula, aromatic and sapid principles, in order to free it from a small proportion of ligneous substance. (?) M. Millon, therefore, thinks that bran and meal ought to be ground over again and mixed with the pure flour, and he has found, by repeated experiments, that this mixture yields a superior kind of bread, and free from the inconveniences of that bread which, in some countries, and particularly in Belgium, is made with coarse meal.—*Id.*

---

* The French Litre has been calculated at 61.02 English cubic inches; the French gramme at 15.43 troy grains; and the French metre at 3.2 English feet.